

REMARKS

Claims 3, 4, and 6 have been previously canceled. Claims 1, 2, 5, and 7 have been amended. Claims 1, 2, 5, and 7 remain in the application.

Claims 1, 2, 5, and 7 were rejected under 35 U.S.C. § 103 as being unpatentable over Longo et al. (U.S. Patent No. 3,723,165). Applicants respectfully traverse this rejection.

U.S. Patent No. 3,723,165 to Longo et al. discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying same. A high temperature plastic powder is flame sprayed in admixture with about 5 – 99 weight percent, and preferably about 40 – 80 weight percent, of a flame spray metal powder by heating the mixture to a temperature sufficient to substantially melt the metal powder and surface heat-soften the high temperature plastic, and propelling the thus heated particles onto a surface, forming a coating. Examples of these high temperature plastics include the well known polyimide plastics, polyamide-polyimide plastics, polyester imide plastics, and aromatic polyester plastics. Typical metal powders for mixing with the plastic are aluminum alloys, nickel alloys, copper, bronze, babbit and stainless steels. Longo et al. does not disclose an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer flame of a composite made of a polymer material and the metal material sprayed on the inner layer and having a second predetermined thickness.

In contradistinction, claim 1, as amended, clarifies the invention claimed as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that “[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.” In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) (“In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.”)

Longo et al. ‘165 does not teach or suggest the claimed invention of claim 1. Specifically, Longo et al. ‘165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. ‘165 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness. In Longo et al. ‘165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a metal material and polymer material to form

an outer layer. There is no suggestion or motivation in the art for modifying Longo et al. '165. The Examiner is required to find a reference that shows spraying a metal inner layer and spraying a metal/plastic outer layer.

A rejection based on 35 U.S.C. § 103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection he advances. He may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F.2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

The present invention sets forth a unique and unobvious thermally sprayed article that decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness as claimed by Applicants. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 1 is allowable over the rejection under 35 U.S.C. § 103.

As to claim 2, claim 2, as amended, clarifies the invention claimed as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second

predetermined thickness. The second predetermined thickness is less than the first predetermined thickness.

Longo et al. '165 does not teach or suggest the claimed invention of claim 2. Specifically, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. '165 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness with the second predetermined thickness being less than the first predetermined thickness. In Longo et al. '165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of metal material and polymer material to form an outer layer. There is no suggestion or motivation in the art for modifying Longo et al. '165. The Examiner is required to find a reference that shows spraying a metal inner layer and spraying a metal/plastic outer layer.

The present invention sets forth a unique and unobvious thermally sprayed article that decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness less than the first predetermined thickness as claimed by Applicants.

Further, the CAFC has held that “[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification”. In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicants’ invention. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 2 is allowable over the rejection under 35 U.S.C. § 103.

As to claim 5, claim 5, as amended, clarifies the invention claimed as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer. The outer layer has a hardness less than the inner layer.

Longo et al. ‘165 does not teach or suggest the claimed invention of claim 5. Specifically, Longo et al. ‘165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. ‘165 lacks an inner layer of a metal material thermally sprayed on an article substrate and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and the outer layer having a hardness less than the inner layer. In Longo et al. ‘165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a polymer material and a metal material to form an the outer layer. There is no suggestion or motivation for modifying Longo et al. ‘165. The Examiner is

required to find a reference that shows spraying a metal inner layer and spraying a metal/plastic outer layer.

Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and the outer layer having a hardness less than the inner layer as claimed by Applicants. The claimed invention is novel and unobvious because the thermally sprayed article decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 5 is allowable over the rejection under 35 U.S.C. § 103.

As to claim 7, claim 7, as amended, clarifies the invention claimed as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and having a second predetermined thickness less than the first predetermined thickness. The outer layer has a hardness less than the inner layer.

Longo et al. '165 fails to teach or suggest the claimed invention of claim 7. Specifically, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. '165 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and

an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and having a second predetermined thickness with the outer layer having a hardness less than the inner layer. In Longo et al. '165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a polymer material and a metal material to form an outer layer. There is no suggestion or motivation for modifying Longo et al. '165. The Examiner is required to find a reference that shows spraying a metal inner layer and spraying a metal/plastic outer layer. The Examiner may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F.2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and having a second predetermined thickness with the outer layer having a hardness less than the inner layer as claimed by Applicants. The claimed invention is novel and unobvious because the thermally sprayed article decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 7 is allowable over the rejection under 35 U.S.C. § 103.

Claim 1 was rejected under 35 U.S.C. § 103 as being unpatentable over Wall (U.S. Patent No. 5,069,937). Applicants respectfully traverse this rejection.

U.S. Patent No. 5,069,937 to Wall discloses thermal spraying of stainless steel. The thermal spraying of stainless steel is applied as an intermediate stage in the provision of a non-stick coating layer over a substrate metal. A method of preparing a roughened surface for subsequent coating with a fluoro polymer in a liquid medium includes thermally spraying (e.g. flame sprayed or sprayed on using an electric arc or plasma gun) the surface with a stainless steel alloy. Wall does not disclose an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness.

In contradistinction, claim 1, as amended, clarifies the invention claimed as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness.

Wall '937 does not teach or suggest the claimed invention of claim 1. Specifically, Wall '937 merely discloses thermal spraying of stainless steel including preparing a roughened surface for subsequent coating with a fluoro polymer in a liquid medium by thermally spraying the surface with a stainless steel. Wall '937 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness. In Wall '937, the roughened surface is

thermally sprayed with a stainless steel and subsequently coated with a fluoro polymer in a liquid medium by, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a polymer material and a metal material to form an outer layer. There is no suggestion or motivation in the art for modifying Wall '937. It is well settled that inherency may not be established by probabilities or possibilities, but must instead be "the natural result flowing from the operation as taught." See In re Oelrich, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981). The Examiner is required to find a reference that shows spraying a metal inner layer and spraying a metal/plastic outer layer.

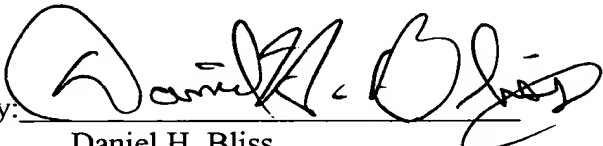
The present invention sets forth a unique and unobvious thermally sprayed article that decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Wall '937, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness as claimed by Applicants. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 1 is allowable over the rejection under 35 U.S.C. § 103.

Obviousness under § 103 is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. Since the Examiner has not provided a sufficient factual basis which is supportive of his position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejections of claims 1, 2, 5, and 7 are improper. Therefore, it

is respectfully submitted that claims 1, 2, 5, and 7 are allowable over the rejections under 35 U.S.C. § 103.

Based on the above, it is respectfully submitted that the claims are in a condition for allowance, which allowance is solicited.

Respectfully submitted,

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